NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorders Division
Washington, D.C. 20594

December 21, 2001

Air Traffic Control Recording

Specialist's Report
by Joseph A. Gregor

A. ACCIDENT

Location:	Shanksville, PA
Date:	September 11, 2001
Time:[1]	
Aircraft:	Boeing 757
NTSB Number:	DCA01SA065

B. GROUP

N/A

C. SUMMARY

On September 11, 2001 United Airlines Flight 93, a Boeing 757 crashed near Shanksville, PA. A certified analog copy of air traffic control (ATC) transmissions recorded on September 11, 2001 at various tower, departure, and Air Route Traffic Control Center (ARTCC) positions along the route of flight was sent to the audio laboratory of the National Transportation Safety Board. These recordings were used to create an audio and text transcript of the aircraft-ground communications from takeoff to accident time.

D. DETAILS OF INVESTIGATION

Transmissions between the accident aircraft and ATC were recorded and an analog copy was sent to the Safety Board's audio laboratory. The tapes cover the following ATC positions and time periods:

Facility	Time Period[1] (UTC)	Position
EWR	1235 - 1247	LC
N90	1238 – 1256	E155
N90	1238 – 1256	B43
ZNY	1245 – 1258	Sector 39R
ZNY	1250 – 1328	Sector 73R
ZOB	1301 - 1331	FKL-R
ZOB	1314 - 1333	LOR-R
ZOB	1333 – 1344	LOR-R
ZOB	1344 - 1400	LOR-R

Sections of the tape recordings containing air-ground transmissions to and from the incident aircraft were digitized at a 22,050 Samples/second data rate and saved as standard Microsoft *.wav* files. individual *.wav* files were combined into a single 1 hour 3 minute 19 second long *.wav* file containing all transmissions to and from the incident aircraft from 1241:49 UTC (aircraft cleared for takeoff) to 1348:47 UTC. A transcript was obtained from the final composite recording. Times are approximate due to limitations inherent in the data obtained from the FAA.

Joseph A. Gregor
Electrical Engineer

Transcript of ATC communications with a Boeing B-757 (United Airlines flight 93) which crashed near Shanksville, PA on September 11, 2001.

LEGEND

UAL-93	Radio transmission from United B-757, flight 93
LC	Radio transmission from Local Control
E155	Radio transmission from Newark Departure
B43	Radio transmission from Liberty West
39R	Radio transmission from Sector 39 Radar position
73R	Radio transmission from Sector 73 Radar position
FKL-R	Radio transmission from Franklin Radar position
LOR-R	Radio transmission from Lorain Radar position
*	Unintelligible word
#	Expletive
( )	Questionable insertion
[ ]	Editorial insertion
...	Pause
--	Interruption

Note 1: Times are expressed in universal coordinated time (UTC).

Note 2: Only radio transmissions to and from the accident aircraft were transcribed.

Note 3: Words shown with excess vowels, letters, or drawn out syllables are a phonetic representation of the words as spoken.

INTRA-COCKPIT COMMUNICATION | AIRCRAFT-TO-GROUND COMMUNICATION

Time (UTC) SOURCE	CONTENT	Time (UTC) SOURCE	CONTENT
Start of recording			
Start of transcript			
		1241:49[+] LC	United ninety three wind three three zero at seven runway four left cleared for takeoff. [EWR 1235-1247 LC]
		1241:53[+] UAL-93	cleared takeoff four left United ninety three. [EWR 1235-1247 LC]
		1242:07[+] LC	United ninety three. [EWR 1235-1247 LC]
		1242:41[+] LC	United ninety three contact departure. [EWR 1235-1247 LC]
		1242:43[+] UAL-93	going to departure United ninety three good day. [EWR 1235-1247 LC]
		1243:00 UAL-93	United ninety three fourteen hundred for twenty five hundred. [N90 1238-1256 Newark Dept.]

INTRA-COCKPIT COMMUNICATION		AIRCRAFT-TO-GROUND COMMUNICATION	
Time (UTC) SOURCE	CONTENT	Time (UTC) SOURCE	CONTENT
		1243:04 E155	United ninety three New York departure good morning radar contact climb and maintain eight thousand and turn left heading three three zero vector for ELIOT. [N90 1238-1256 Newark Dept.]
		1243:12 UAL-93	eight thousand heading three three zero for ELIOT United ninety three. [N90 1238-1256 Newark Dept.]
		1243:48 E155	United ninety three turn left heading uh two eight zero. [N90 1238-1256 Newark Dept.]
		1243:52 UAL-93	left two eighty United ninety three. [N90 1238-1256 Newark Dept.]
		1244:34 E155	United ninety three climb and maintain one zero thousand. [N90 1238-1256 Newark Dept.]
		1244:38 UAL-93	climb and maintain one zero thousand ten thousand United ninety three. [N90 1238-1256 Newark Dept.]
		1245:10 E155	United ninety three do not exceed two five zero knots. [N90 1238-1256 Newark Dept.]
		1245:13 UAL-93	not exceed two fifty United ninety three. [N90 1238-1256 Newark Dept.]

INTRA-COCKPIT COMMUNICATION		AIRCRAFT-TO-GROUND COMMUNICATION	
Time (UTC) SOURCE	CONTENT	Time (UTC) SOURCE	CONTENT
		1245:54 E155	United ninety three resume normal speed contact departure one three five point three five. [N90 1238-1256 Newark Dept.]
		1246:00 UAL-93	one three five three five normal speed good day United ninety three. [N90 1238-1256 Newark Dept.]
		1246:18[+] UAL-93	United ninety three is with you one zero thousand, normal speed, heading two eighty. [N90 1238-1256 Liberty West]
		1246:23[+] B43	United ninety three departure good morning, climb maintain one four thousand. [N90 1238-1256 Liberty West]
		1246:26[+] UAL-93	climb maintain one four thousand United ninety three. [N90 1238-1256 Liberty West]
		1248:03[+] B43	United ninety three right turn heading of ah three one zero. [N90 1238-1256 Liberty West]
		1248:07[+] UAL-93	right heading three one zero United ninety three. [N90 1238-1256 Liberty West]
		1248:41[+] B43	United ninety three climb maintain one six thousand. [N90 1238-1256 Liberty West]

INTRA-COCKPIT COMMUNICATION

Time (UTC) SOURCE	CONTENT

AIRCRAFT-TO-GROUND COMMUNICATION

Time (UTC) SOURCE	CONTENT
1248:44[+] UAL-93	climb maintain one six thousand United ninety three. [N90 1238-1256 Liberty West]
1249:31[+] B43	United ninety three climb maintain one seven thousand go direct ELIOT on course. [N90 1238-1256 Liberty West]
1249:35[+] UAL-93	up to one seven thousand direct ELIOT United ninety three. [N90 1238-1256 Liberty West]
1250:37[+] B43	United ninety three contact New York center one three two point one good day. [N90 1238-1256 Liberty West]
1250:41[+] UAL-93	thirty two one good day United ninety three. [N90 1238-1256 Liberty West]
1250:57[+] UAL-93	and New York United ninety three with you one seven thousand. [ZNY 1245-1258 R39]
1251:03 R39	United ninety three New York center climb and maintain flight level two eight zero. [ZNY 1245-1258 R39]
1251:07 UAL-93	maintain two eight oh United ninety three. [ZNY 1245-1258 R39]
1254:09[+] R39	United ninety three cleared direct DEMO. [ZNY 1245-1258 R39]

INTRA-COCKPIT COMMUNICATION

Time (UTC) SOURCE	CONTENT

AIRCRAFT-TO-GROUND COMMUNICATION

Time (UTC) SOURCE	CONTENT
1254:12 UAL-93	direct DEMO United ninety three. [ZNY 1245-1258 R39]
1254:53 R39	United ninety three contact New York center one three three point four correction New York center one thirty two eighty seven. [ZNY 1245-1258 R39]
1254:59[+] UAL-93	one thirty two eighty seven good day United uh ninety three. [ZNY 1245-1258 R39]
1255:05[+] UAL-93	good morning New York United ninety three with you twenty five and a half for two eight oh. [ZNY 1250-1328 R73]
1255:09[+] R73	United ninety three New York center good morning. [ZNY 1250-1328 R73]
1257:12[+] R73	United ninety three climb and maintain flight level three five zero. [ZNY 1250-1328 R73]
1257:16[+] UAL-93	leaving two eight for three five oh United ninety three. [ZNY 1250-1328 R73]
1322:20 UAL-93	United ninety three starting to pick up some light chop at thirty five, any ride reports? [ZNY 1308-1328 RA73]

INTRA-COCKPIT COMMUNICATION		AIRCRAFT-TO-GROUND COMMUNICATION	
Time (UTC) SOURCE	CONTENT	Time (UTC) SOURCE	CONTENT
		1322:26 RA73	the ah first complained I've had and United ah ninety three, contact the Cleveland center now on one three three point zero seven. [ZNY 1308-1328 RA73]
		1322:37 UAL-93	thrity three oh seven United ninety three. [ZNY 1308-1328 RA73]
		1323:00 ACARS	BEWARE ANY COCKPIT INTROUSION. . TWO AIRCRAFT IN NY, HIT TRADE CNTER BUILDS
		1323:05 UAL-93	morning Cleveland it's United ninety three with you at three five oh ah there's some light chop here at thirty five any ride reports? [ZOB 1301-1331 Franklin-R]
		1323:14 FKL-R	an no just a little light chop nothing worse than that United ninety three. [ZOB 1301-1331 Franklin-R]
		1323:56 FKL-R	United ninety three Cleveland one three three three seven. [ZOB 1301-1331 Franklin-R]
		1324:00 UAL-93	one three three three seven good day United ninety three. [ZOB 1301-1331 Franklin-R]
		1324:20[+] UAL-93	good morning Cleveland United ninety three is with you at three five oh intermittent light chop. [ZOB 1314-1333 Lorain-R]

INTRA-COCKPIT COMMUNICATION		AIRCRAFT-TO-GROUND COMMUNICATION	
Time (UTC) SOURCE	CONTENT	Time (UTC) SOURCE	CONTENT
		1325:06[+] UAL-93	United ninety three checking in three five oh. [ZOB 1314-1333 Lorain-R]
		1325:08[+] LOR-R	United ninety three three five zero roger. [ZOB 1314-1333 Lorain-R]
		1327:25[+] LOR-R	United ninety three that traffic for you is one o'clock twelve miles east bound three seven zero. [ZOB 1314-1333 Lorain-R]
		1327:30[+] UAL-93	negative contact we're looking United ninety three. [ZOB 1314-1333 Lorain-R]
		1328:16[+] UAL-93	*** (mayday) *** (hey get out of here) ***. [ZOB 1314-1333 Lorain-R]
		1328:48[+] UAL-93	*** (get out of here) *** (get out of here). [ZOB 1314-1333 Lorain-R]
		1329:14[+] LOR-R	United ninety three verify three five zero. [ZOB 1314-1333 Lorain-R]
		1329:20[+] LOR-R	United ninety three verify you're at flight level ah three five zero. [ZOB 1314-1333 Lorain-R]
		1329:34[+] LOR-R	United ninety three verify you're level at three five zero. [ZOB 1314-1333 Lorain-R]

INTRA-COCKPIT COMMUNICATION		AIRCRAFT-TO-GROUND COMMUNICATION	
Time (UTC) SOURCE	CONTENT	Time (UTC) SOURCE	CONTENT
		1329:40[+] LOR-R	United ninety three Cleveland. [ZOB 1314-1333 Lorain-R]
		1329:56[+] LOR-R	United ninety three Cleveland. [ZOB 1314-1333 Lorain-R]
		1330:03[+] LOR-R	United ninety three if you hear Cleveland center ident please. [ZOB 1314-1333 Lorain-R]
		1330:58[+] LOR-R	United ninety three Cleveland if you hear the center ident. [ZOB 1314-1333 Lorain-R]
		1331:55[+] UAL-93	*** please sit down. keep remaining seating. we have a bomb on board. so ***. [ZOB 1314-1333 Lorain-R]
		1332:05[+] LOR-R	er uh calling Cleveland center you're unreadable say again slowly. [ZOB 1314-1333 Lorain-R]
		1335:36 LOR-R	ah United ninety three if able * ah squawk trip please. [ZOB 1333-1344 Lorain-R]
		1336:51 LOR-R	[Cleveland center announces that UAL93 is turning south and east and climbing]. [ZOB 1333-1344 Lorain-R]

INTRA-COCKPIT COMMUNICATION		AIRCRAFT-TO-GROUND COMMUNICATION	
Time (UTC) SOURCE	CONTENT	Time (UTC) SOURCE	CONTENT
		1339:10 UAL-93	ah this is the captain uh would like to all remain seated there is a bomb aboard and we go back to the airport and to have our demands so please remain quiet. [ZOB 1333-1344 Lorain-R]
		1339:19 LOR-R	okay thats United ninety three calling? [ZOB 1333-1344 Lorain-R]
		1339:24 LOR-R	United ninety three understand you have a bomb on board go ahead. [ZOB 1333-1344 Lorain-R]
		1340:01 LOR-R	United ninety three go ahead. [ZOB 1333-1344 Lorain-R]
		1340:12 LOR-R	United ninety three go ahead. [ZOB 1333-1344 Lorain-R]
		1341:01 LOR-R	United ninety three do you hear Cleveland center? [ZOB 1333-1344 Lorain-R]
		1341:36 LOR-R	[Cleveland center announces loss of transponder signal from UAL93] [ZOB 1333-1344 Lorain-R]
		1345:29[+] LOR-R	United ninety three Cleveland do you still hear the center? [ZOB 1344-1400 Lorain-R]

INTRA-COCKPIT COMMUNICATION		AIRCRAFT-TO-GROUND COMMUNICATION	
Time (UTC) SOURCE	CONTENT	Time (UTC) SOURCE	CONTENT
		1345:35[+] LOR-R	United ninety three do you still hear Cleveland? [ZOB 1344-1400 Lorain-R]
		1346:13[+] LOR-R	United ninety three United niner three do you hear Cleveland? [ZOB 1344-1400 Lorain-R]
		1347:28[+] LOR-R	United ninety three United ninety three Cleveland. [ZOB 1344-1400 Lorain-R]
		1348:43 LOR-R	United ninety three United ninety three do you hear Cleveland center. [ZOB 1344-1400 Lorain-R]

End of transcript

[+]times verified via FAA timecode reader.

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1241:53	UAL-93	cleared takeoff four left United ninety three. [EWR 1235-1247 LC]
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1245:10	E155	United ninety three do not exceed two five zero knots. [N90 1238-1256 Newark Dept.]
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1245:54	E155	United ninety three resume normal speed contact departure one three five point three five. [N90 1238-1256 Newark Dept.]
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1327:25	LOR-R	United ninety three that traffic for you is one o'clock twelve miles east bound three seven zero. [ZOB 1314-1333 Lorain-R]
1327:30	UAL-93	negative contact we're looking United ninety three. [ZOB 1314-1333 Lorain-R]
1328:16	UAL-93	*** (mayday) *** (hey get out of here) ***. [ZOB 1314-1333 Lorain-R]
1328:48	UAL-93	*** (get out of here) *** (get out of here). [ZOB 1314-1333 Lorain-R]
1329:14	LOR-R	United ninety three verify three five zero. [ZOB 1314-1333 Lorain-R]
1329:20	LOR-R	United ninety three verify you're at flight level ah three five zero. [ZOB 1314-1333 Lorain-R]
1329:34	LOR-R	United ninety three verify you're level at three five zero. [ZOB 1314-1333 Lorain-R]
1329:40	LOR-R	United ninety three Cleveland. [ZOB 1314-1333 Lorain-R]
1329:56	LOR-R	United ninety three Cleveland. [ZOB 1314-1333 Lorain-R]

1330:03	LOR-R	United ninety three if you hear Cleveland center ident please. [ZOB 1314-1333 Lorain-R]
1330:58	LOR-R	United ninety three Cleveland if you hear the center ident. [ZOB 1314-1333 Lorain-R]
1331:55	UAL-93	*** please sit down. keep remaining seating. we have a bomb on board. so ***. [ZOB 1314-1333 Lorain-R]
1332:05	LOR-R	er uh calling Cleveland center you're unreadable say again slowly. [ZOB 1314-1333 Lorain-R]
1335:36	LOR-R	ah United ninety three if able * ah squawk trip please. [ZOB 1333-1344 Lorain-R]
1336:51	LOR-R	[Cleveland center announces that UAL93 is turning south and east and climbing]. [ZOB 1333-1344 Lorain-R]
1339:10	UAL-93	ah this is the captain uh would like to all remain seated there is a bomb aboard and we go back to the airport and to have our demands so please remain quiet. [ZOB 1333-1344 Lorain-R]
1339:19	LOR-R	okay thats United ninety three calling? [ZOB 1333-1344 Lorain-R]
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1340:01	LOR-R	United ninety three go ahead. [ZOB 1333-1344 Lorain-R]
1340:12	LOR-R	United ninety three go ahead. [ZOB 1333-1344 Lorain-R]
1341:01	LOR-R	United ninety three do you hear Cleveland center? [ZOB 1333-1344 Lorain-R]
1341:36	LOR-R	[Cleveland center announces loss of transponder signal from UAL93] [ZOB 1333-1344 Lorain-R]
1345:29	LOR-R	United ninety three Cleveland do you still hear the center? [ZOB 1344-1400 Lorain-R]
1345:35	LOR-R	United ninety three do you still hear Cleveland? [ZOB 1344-1400 Lorain-R]
1346:13	LOR-R	United ninety three United niner three do you hear Cleveland? [ZOB 1344-1400 Lorain-R]
1347:28	LOR-R	United ninety three United ninety three Cleveland. [ZOB 1344-1400 Lorain-R]
1348:43	LOR-R	United ninety three United ninety three do you hear Cleveland center. [ZOB 1344-1400 Lorain-R]